Exploring Marketing Orientation Influences on Internet Adoption in the U.S. Lumber Industry

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Abstract

Successful Internet-based business practice adoption and implementation is contingent on a number of factors. In this paper, we examine the influence of corporate culture on Internet adoption. Specifically, we focus on the question "Does a high marketing orientation have a positive effect on the Internet adoption and implementation effectiveness?" To answer this question, the authors developed and tested a model that examines the mediating influence of marketing orientation across a number of independent variables on organizational success and effectiveness of Internet adoption. Although not all results were statistically significant, all were directionally as hypothesized with a high marketing orientation being more positively correlated to perceived Internet implementation effectiveness.

Introduction

For many years, scholars in organizational behavior have attempted to demonstrate the link between an organization's culture and its performance. A common thread that affects organizational performance and productivity are the widely shared and strongly held values that underlie and define an organization's culture. It has been argued that the success of an organization's overall strategy depends, to a significant extent, on organizational culture (Yip 1995).

What is corporate culture? Desphandé and Webster (1989) reviewed several studies and defined organizational (or corporate) culture as "the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provide them with the norms for behavior in the organization". Schneider and Rentsch (1988) describe culture as "why things happen the way they do", and organizational climate as "what happens around here". Cultures can be determined by the values, assumptions and interpretations of organization members (Hales 1998). These factors can be organized by a common set of dimensions on both psychological and organizational levels (Cameron and Freeman 1991).

Marketing and production are often viewed as corporate orientations or cultures. In a marketing orientation, organizations develop and maintain organizational objectives, skills and resources to adapt to changing market opportunities and conditions (Jaworski and Kohli 1993). Business success depends on effective analysis of marketing opportunities, researching and selecting target markets, designing marketing strategies, planning marketing programs, and organizing, implementing and controlling marketing efforts (Kotler 2000). A production orientation, on the other hand, concentrates on achieving high production efficiency to minimize costs and mass distribution (Kotler 1988). Under such culture, organizations operate on the assumption that consumers prefer products that are widely available and inexpensive. Success is often based on technological efficiency-driven cost reduction.

Changing customer tastes and preferences, competition and other marketplace forces can promote the transition from production orientation culture to marketing orientation. Often there is a perceived mutually exclusive dichotomy between these two orientations when, in reality, there are elements of both in any organization. Further, companies could have a blend of other orientations including technology orientation, research and development orientation, etc.

In this paper, we attempt to model the elements that connote a strong marketing orientation and then see if this orientation has an effect on Internet adoption for conducting business and, in turn, on the perceived effectiveness of the implementation effort.

The model

Figure 1 provides a model for the measurement of Internet adoption effectiveness related to corporate orientation. In this model, corporate orientation plays a moderating role in systematically modifying either the form and/or strength of the relationship between the predictor variables ("perceived company effectiveness of Internet adoption") and the criterion variables that influence Internet adoption (such as "extent of Internet application", "user participation", "perceived ease of use by user", "perceived usefulness by user" and "adoption diffusion by company") (from Sharma et al. 1981).

The items used to measure marketing orientation were adapted primarily from McCarthy and Perreault (1987), Kotler et al. (1997), Kotler (2000), Keegan et al. (1992), and Elliot (1990).

Since information technology (IT) adoption (such as Internet adoption) constructs could be perceived to be rather broad, a modified version of a similar instrument developed by the Computer Science and Telecommunications Board of the National Research Council in 1991 (Anonymous 1994) was adapted for Internet adoption (as an example of IT application) as well as other items from the Technology Acceptance Model (TAM) developed by Davis (1989) and Davis et al. 1989).
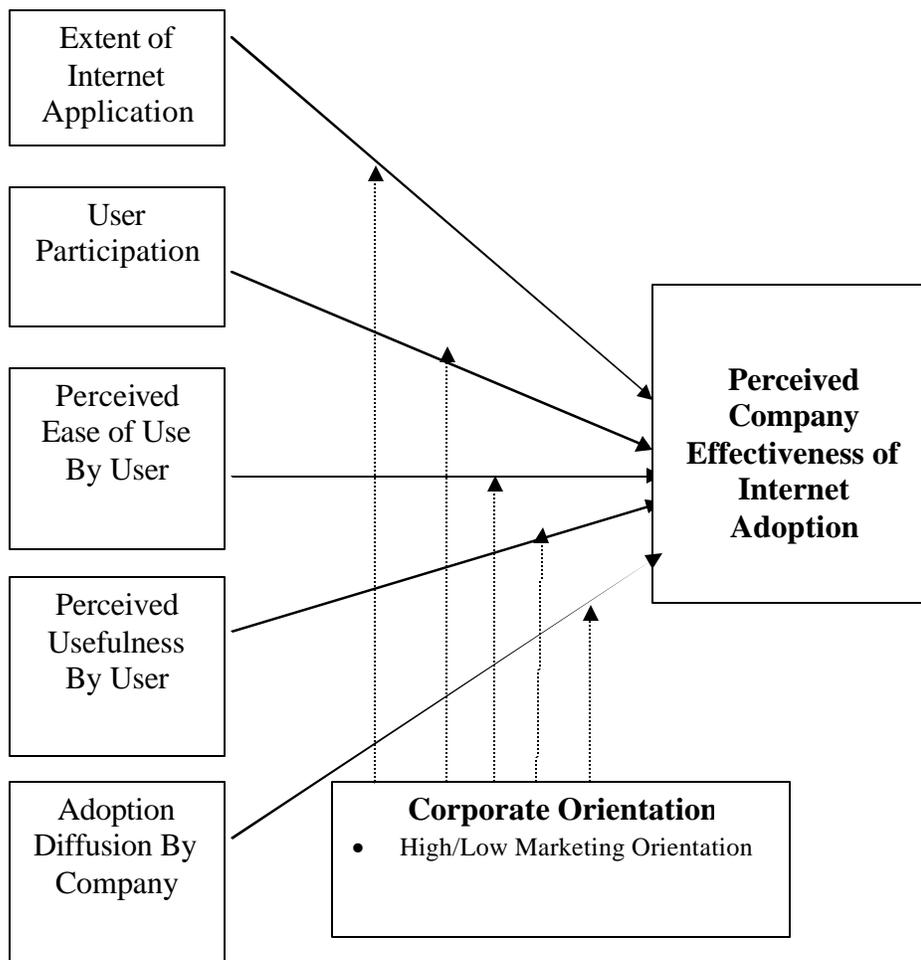
Figure 1. Model of Internet Adoption/Corporate Marketing Orientation Interaction

Model constructs

There is a rich body of literature for each of the constructs in the model. We offer a brief discussion that we believe capture salient concepts and references for each construct.

Extent of Internet Application

The "extent of Internet application" construct describes the extent to which an organization applies the Internet to making, implementing and evaluating organizational decisions. Its benefits are commonly based on enhanced decision-making or improved business performance. The use of information in decision-making involves integrating information sources and selecting among alternative strategies (Bettman et al. 1990), whereas information use in decision implementation concerns how decisions should be carried out (Nutt 1986). Information use in evaluation, on the other hand, refers to the determination of positive and negative performance outcomes and the reasons for the outcomes (Zaltman and Moorman 1989).

The development of information technology (IT) such as the Internet comes with a significant risk of whether the end-users will actually use it or not. To ensure continued use, external variables (such as technical features and organizational environment), internal psychological variables (such as past education and attitude to system use) and past usage (prior experience) must be considered (Bajaj and Nidumoli 1998, Taylor and Todd 1995). For users of IT to realize the full potential of the technology, they must be willing to use the technology and become effective users. Unfortunately, many IT applications are misused, underutilized or abandoned (Martinsons and Chong 1999, McDermott 1987).

User Participation

There are differences of opinion regarding the definition of user participation in the organizational behavior literature (e.g. Locke and Schweiger 1979, Vroom and Jago 1988). User participation could be considered as "taking part" in some activity. Such participation may be direct or indirect, formal or informal, performed alone or in a group, covering varying scopes of activities during systems development and implementation (Vroom and Jago, 1988). Ives and Olson (1984) suggested that assessing a wide variety of specific behaviors, activities, and assignments is more accurate, reliable and valid than measures assessing general opinions during user participation evaluation (Cote and Buckley 1987, Barki and Hartwick 1994)).

It has been suggested that the participation of users in the design and implementation of IT promotes greater user acceptance, IT usage, system quality, organizational impact and increased user satisfaction, which could lead to increased IT implementation success (Hwang and Thorn 1999, Lin and Shao 2000, Amoako-Gyampah and White 1997). Orientations that are high in trust and mutual supportiveness foster higher levels of communication, shared identity and commitment (Mohr and Nevin 1990). This also generates confidence in the users that the IT system is reliable (Rotter 1971) and encourages users to take risks (Ring and Van De Ven 1992).

Perceived Ease of Use by User

Perceived ease of use has been established from previous research to be an important factor influencing user acceptance and usage behavior of information

technologies (Igbaria et al. 1995). It describes the individual's perception of how easy the innovation is to learn and use. The Technology Acceptance Model (TAM) developed by Davis et al. (1989), which emphasizes the roles played by perceived ease of use and perceived usefulness in influencing technology adoption decisions, has been widely used to predict user acceptance (Plouffe et al. 2001, Karahanna and Straub 1999, Thompson et al. 1991, Venkatesh and Davis 1996).

Perceived Usefulness by User

Perceived usefulness has been found to influence adoption behaviors. Davis (1989) defines perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her performance". It is an example of extrinsic motivation that is found to play a greater role in an individuals' behavior (Igbaria et al. 1995). According to Liao and Cheung (2002) the most important attitudes underlying perceived usefulness of and willingness to use IT are expectations of accuracy, security, network speed, user-friendliness, user participation and convenience. Expectation-confirmation theory adapted from the consumer behavior literature and integrated with theoretical and empirical findings from prior IT usage research suggest that users' continued intention is determined by their satisfaction with IT use and perceived usefulness of continued use. User satisfaction, in turn, is also influenced by the user's confirmation of expectation from prior IT use (Bhattacherjee 2001). According to Igbaria et al. (1996) perceived usefulness (rather than perceived fun or social pressure) is the principal motivator of corporate use of computers.

Adoption Diffusion in the Company

Explanations of adopter attitudes on innovation adoption and diffusion has long converged on a core set of theoretical frameworks that stem from the Technology Acceptance Model (TAM) discussed earlier (Davis et al. 1989) and the Diffusion of Innovations model (Rogers 1983). Rogers (1995) work on diffusion theory has provided an important set of theoretical constructs, called "perceived characteristics of an innovation", which is valuable in understanding adoption and diffusion. These constructs include relative advantage, compatibility, complexity, trialability and observability.

Other theories include the Theory of Reasoned Action (Ajzen and Fishbein 1980) which posits that personal attitudes and subjective norms play major roles in determining intentions to use; the Theory of Planned Behavior (Ajzen 1985, Taylor and Todd 1995) which suggests that a behavior is a direct function of behavioral intention, which in turn, is formed by attitude, which reflects feelings of favor or disfavor toward a behavior; and Social Cognitive Theory (Compeau and Higgins 1995) which proposes that contextual supports and barriers play key roles in behavior formation.

However, these frameworks have been reported to neglect the realities of implementing technology innovations within organizations when adoption decisions are not made at the individual level but at organizational, division or workgroup levels (Orlikowski 1993, Fichman and Kemerer 1997) where authorities make the decision to adopt technology and targeted users have to make the necessary adjustments for using it to perform their jobs (Zaltman et al. 1973).

The diffusion of IT, however, is a complex process that is influenced by numerous factors such as perceived characteristics of the innovation, subjective norms, stages of

adoption, user competence, implementation processes, and organizational factors (Chiasson and Lovato 2001). Other findings suggest that migration costs (Chau and Tam 2000), earliness of adoption, top management support and organizational size are positively associated with diffusion (Eder and Igbaria 2001, Knol and Stroeken 2001).

Corporate Orientation
        Foundation concepts of corporate orientation, or culture, were provided in the introduction to this paper. There is a wide spectrum of orientations that organizations could adopt which can focus on technology, research and development, maximizing shareholder value, and production. However, in this study, we examine the marketing orientation. We'd like to stress, once again, that an organization may have high marketing orientation concurrent with other orientations at any point in time.
        A marketing-oriented organization generates market intelligence, disseminates the intelligence across departments and provides the appropriate response to the needs of the market at a profit (Kohli and Jaworski 1990). Although marketing orientation has been posited to lead to greater customer satisfaction and organizational commitment of employees (Narver and Slater 1990), arguments have been advanced that a marketing orientation may have either a strong or weak effect on business performance depending on the environmental conditions such as market turbulence and competitive intensity (Houston 1986).

Perceived Company Effectiveness of Internet Adoption
        Perceived effectiveness of Internet adoption is the extent to which individuals believe that the adoption of the Internet has been successful. Despite remarkable advances in information technology, many IT projects still often fall short of performance expectations. Many implementation failures result from non-technical factors. For example, Griffith et al. (1999) believe that technology implementation success could be improved with active top management support, clear implementation goals and user participation and training. Other success factors include a good understanding of the intended end-users, their tasks, and the interdependencies between the two, together with the appropriate business strategy (Martinsons and Chong 1999).
        Unfortunately, IT success can sometimes be elusive (Davis, 1991). An effective IT application is expected to improve performance, but if poorly planned, developed or implemented without due recognition to increase human resource effectiveness, it can breed disaster and retard individual and/or group performance (Templer 1989).
        While use of an information system is widely regarded as an indicator of its success, effectiveness or acceptance (Szajna1993), the realization of user expectation has been suggested as one possible means of assessing the eventual success or failure of IT adoption (Van De Ven 1976). Other performance factors include functioning of existing transaction/reporting systems, linkage to strategic processes of the firm, amount and quality of user participation, responsiveness to new systems needs, ability to respond to end-user computing needs, IT staff quality and reliability of services (Miller and Doyle (1987).

Hypotheses

        In the context of one sector in the forest products industry, relationships between IT (Internet) adoption factors (independent variables) and "perceived company effectiveness of IT (Internet) adoption" (dependent variable) were studied. For the purposes of this study, when the marketing orientation is high relative to a production orientation, the organization is defined as a having high marketing orientation.

        We sought to discover the relationship between the factors of Internet adoption and perceived effectiveness of Internet adoption in the company as they may be moderated by the dominant organizational orientation (marketing orientation). Thus, the relationships between each set of variables were posited to be positive for high marketing orientation and negative for low marketing orientation.

Hypothesis 1: The relationship between "extent of Internet application" and "perceived company effectiveness of Internet adoption."

Hypothesis 2: The relationship between "user participation" and "perceived company effectiveness of Internet adoption."

Hypothesis 3. The relationship between "perceived ease of use by user" and "perceived company effectiveness of Internet adoption."

Hypothesis 4: The relationship between "perceived usefulness by user" and "perceived company effectiveness of Internet adoption."

Hypothesis 5. The relationship between "adoption diffusion by company" and "perceived company effectiveness of Internet adoption."

The study

        In 2002, a study was undertaken to identify adoption of Internet-based information technologies in the U.S lumber industry. 1,250 sawmills of varying sizes were randomly selected. Data for the study were collected through a mail survey using questionnaires. The process of questionnaire design followed guidelines and recommendations by Dillman (1978), Churchill (1979), Mangione (1995), and Burns and Bush (1998). Mail questionnaire procedures including pre-notification of initial mailing, an initial mailing, a post-survey reminder, and two subsequent survey mailings. Companies were surveyed at the corporate headquarter level. Key informants were senior-level managers. Based on the literature, we developed an extensive list of topics and questions. The instrument tested constructs using measures developed by the researchers as well as measures adapted from other sources, which had been tested in previous studies.

Results and analysis

        Of the 1,250 companies that were initially sampled, the adjusted sample size after accounting for non-deliverable surveys as a result of company closures or change of address was 1,161. Of these, 394 surveys were received and all were useable, resulting in an adjusted response rate of 34 percent. The majority of respondents (92 percent) had

revenue of less than $100 million in 2001. Nine percent had revenue between $250 million and $1 billion. Respondent distribution by size closely matches the overall size distribution of U.S. sawmill industry companies (Best Lists 2002).

Model testing

Internet Adoption Factors

A principal axis factor analysis with communalities in the primary diagonal and a varimax rotation on the summated scale of each of the variables in the study was conducted to determine the relevant items for each variable. The internal consistency (Cronbach's a) for the dependent variable, "perceived company effectiveness of IT adoption" was .73, and that for the predictor variables ranged from .69 for "adoption diffusion by company" and .91 for "perceived usefulness by user". These were all within the customary range for the internality dimension of the Levenson measure (Presson et al. 1997).

An iterative process resulted in a reduction of items in each factor. Using factor loadings greater than 0.50 as the practically significant separation criterion led to a reduction from ten items to six for "extent of IT application", from seven items to five for "user participation", from seven items to six for "perceived ease of use", from nine items to six for "perceived usefulness", and from six items to three for "adoption diffusion" (**Table 1**). Items for "perceived company effectiveness of IT adoption" were reduced from eleven to six. The factor loadings for corporate orientation, "marketing orientation" resulted in a six-item construct.

Tolerance statistics for the predictors, placed in a complete equation with "perceived company effectiveness of IT adoption" as the dependent variable, ranged from .37 for "perceived ease of use by user" to .82 for "marketing-orientation" with mean of .60, indicating that multicollinearity among the predictors was not a concern (Hair et al. 1998).

Table 1. Factor Analysis of IT Adoption Factors

Factor	Items	Factor Loadings	Cronbach's Alpha
Extent of Internet application	Internet use saves my company money	.63	.81
	Internet use in my company is important for market research	.66	
	Internet use in my company is important for decision making	.63	
	Internet use in my company has changed the nature of competition among companies	.58	
	Internet has been easy to adopt because of high technical skills of IT personnel in my company	.62	
	Internet has been easy to adopt because of the compatibility with existing systems in my company	.53	
User participation	Employees play active part in making decisions about Internet adoption	.70	.79
	Clear, planned goals and objectives about Internet adoption	.57	
	Constructive suggestions about improvement Internet adoption	.79	
	Employees strong interest in Internet adoption	.82	
	Co-workers promotion of Internet adoption	.68	
Perceived ease of use by user	It is easy to find ways to perform my job using the Internet	.83	.84
	The Internet has made my job easier	.89	
	Technical support by my company	.67	
	Technical support from outside company	.59	
	Clear understanding of the Internet to perform job better	.50	
	I enjoy using the Internet in performing my job	.81	
Perceived usefulness by user	Technical support from outside company	.52	.91
	Provides powerful information	.77	
	Increases productivity	.88	
	Increases working relationship	.58	
	Job quality is increased	.85	
	Gain greater work control	.77	
Adoption diffusion by company	Top management	.57	.69
	Desirable supervisor	.87	
	Co-workers	.65	

Perceived company effectiveness of Internet adoption	Importance of the Internet, all things considered	.78	.73
	Importance of the Internet for you to perform job	.61	
	Valuableness of Internet use in performing job	.82	
	Management support	.50	
	Usefulness of the Internet in doing business	.66	
	Level of training	.55	
Marketing orientation	Use of marketing research to determine customer needs	.76	.80
	Use of marketing research to determine customer satisfaction	.74	
	Engagement in innovation focusing on new market opportunities	.63	
	Consideration of packaging as a selling tool	.50	
	Focuses advertisements on the benefits of products and services	.56	
	Focuses advertisements on product features and quality	.62	

Extraction method: Principal axis factor analysis. Rotation Method: Varimax Kaiser Normalization

Intercorrelations, standard deviations and the means of all the study variables, including factors influencing Internet adoption, "Perceived company effectiveness of Internet adoption", and the moderating variable (marketing orientation), are presented in **Table 2**. The correlations were all significant at a 0.05 alpha level.

Table 2. Means, Standard Deviations and Intercorrelations for All Study Variables

Variables		n	M	SD	1	2	3	4	5	6
Dependent variable	1. Perceived company effectiveness of Internet adoption	209	3.01	.75						
Independent variable	2. Extent of Internet application	208	2.63	.79	.45					
	3. User participation	206	2.56	.96	.33	.52				
	4. Perceived ease of use by user	206	2.83	.92	.42	.61	.42			
	5. Perceived usefulness by user	200	2.49	.93	.40	.62	.38	.77		
	6. Adoption diffusion by company	201	2.97	.99	.23	.38	.36	.23	.27	
Moderator variable	7. Marketing orientation	386	2.65	.92	.18	.40	.33	.22	.29	.22

Moderating influence of marketing orientation on Internet adoption

Hypotheses were tested by use of moderated multiple regression. The question of how many antecedent variables to examine in each regression analysis was a choice to be made during the analysis of the interactions. The choice requires the option of sacrificing statistical power by putting all antecedents into a single analysis or tolerating some amount of Type I inflation error by executing separate models. The lower power alternative is to regress "perceived company effectiveness of IT adoption" simultaneously on all five antecedents, corporate orientation (marketing orientation), and all five interaction terms (i.e., each antecedent X corporate orientation). This test has 12 degrees of freedom relative to an analysis that considers each antecedent and moderator separately. The latter analysis, which was used in this study, yields greater statistical power and each regression consumes 4 degrees of freedom. The many factors that contribute to diminish the opportunity of detecting moderator effects influenced the choice of separate regression analyses.

Results of these analyses are shown in **Table 3**. The nature and direction of their significant interactions were examined graphically as shown in Figures 2 – 6. Separate regression lines were computed and subsequently plotted based on a mean which is +/- 1 standard deviation split for marketing orientation, using the guideline suggested by Cohen et al. (1983). Hence, M_H (high marketing orientation) and M_L (low marketing orientation) correspond to one standard deviation above and below the mean market orientation and their corresponding regression lines are Y_H and Y_L. The mean market orientation was estimated as 2.65, and its SD was .92.

Table 3. Results of Hierarchical Regression Analyses for Perceived Company Effectiveness of Internet Adoption

	Extent of Internet Adoption				User Participation				Perceived Ease of Use by User				Perceived Usefulness by User				Adoption Diffusion by Company			
	ß	p	R	?R²	ß	p	R	?R²	ß	p	R	?R²	ß	p	R	?R²	ß	p	R	?R²
Step 1	.42	.00	.45	.20	.25	.00	.33	.11	.34	.00	.42	.18	.32	.00	.40	.16	.17	.00	.23	.05
Step 2	.42 / .01	.00 / .91	.46	.01	.22 / .08	.00 / .17	.34	.01	.31 / .09	.00 / .12	.43	.00	.28 / .10	.00 / .11	.40	.00	.15 / .10	.00 / .10	.26	.02
Step 3	1.16 / .68 / -.26	.00 / .00 / .00	.53	.07	.86 / .64 / -.22	.00 / .00 / .00	.43	.07	.80 / .60 / -.18	.00 / .00 / .00	.48	.05	.83 / .58 / -.20	.00 / .00 / .00	.47	.06	.51 / .48 / -.13	.00 / .01 / .03	.30	.02

Note. Step 1 represents the regression of "perceived company effectiveness of Internet adoption" on the antecedent. Step 2 represents the simultaneous regression of "perceived company effectiveness of Internet adoption" on both the antecedent and the moderator variable (marketing orientation). Step 3 represents the simultaneous regression of "perceived company effectiveness of Internet adoption" on the antecedent, the moderator variable, and the interaction term. n = 195 – 207.

Recall that the hypothesized independent variable relationships to "Perceived company effectiveness of Internet adoption" would be moderated by a marketing

orientation such that the relationship would be positive for high marketing orientation and negative for low marketing orientation. In all cases, both high and low marketing orientation relationship lines are positively sloped, however, under high marketing orientation, the slopes are steeper. These findings directionally are supportive but due to the positive/negative dichotomy hypothesized, all hypotheses were rejected. Following is a summary of results for each hypothesis.

Hypothesis 1: (Figure 2)
Variable compared: "Extent of Internet application"
Interaction: Significant ($ß = -.26$; $P < .05$)
Hypothesis 1 was not fully supported.

Hypothesis 2: (Figure 3)
Variable compared: "User participation"
Interaction: Significant ($ß = -.22$; $p < .05$)
Hypothesis 2 was not fully supported.

Hypothesis 3: (Figure 4)
Variable compared: "Perceived ease of use by user"
Interaction: Significant ($ß = -.18$; $p < .05$)
Hypothesis 3 was not fully supported.

Hypothesis 4: (Figure 5)
Variable compared: "Perceived usefulness by user"
Interaction: Significant ($ß = -.20$; $p < .05$)
Hypothesis 4 was not fully supported.

Hypothesis 5: (Figure 6)
Variable compared: "Adoption diffusion by company"
Interaction: Significant ($ß = .74$; $p < .05$)
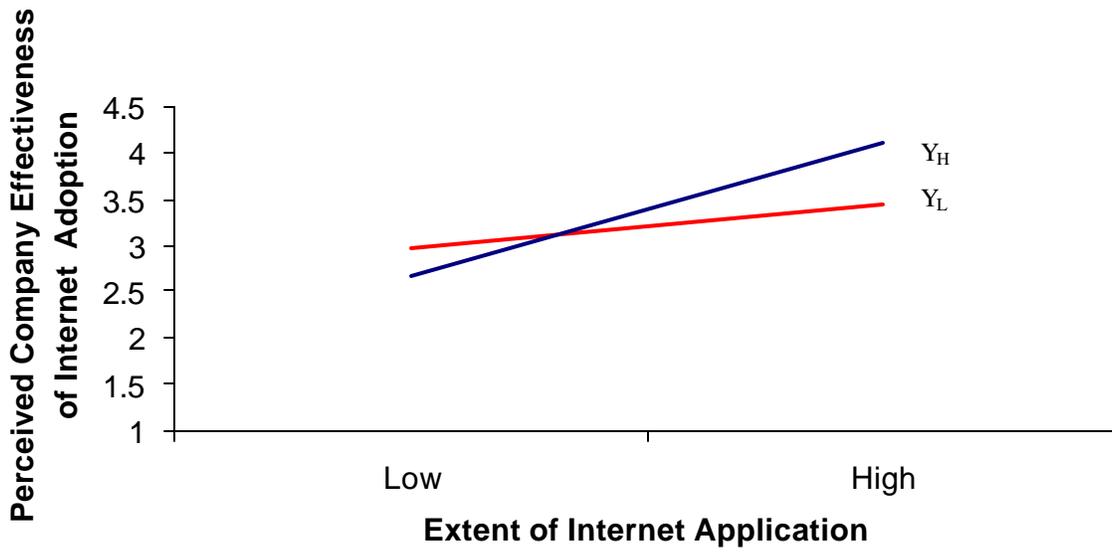Hypothesis 5 was not fully supported.

Figure 2. Interaction of Corporate Orientation and Extent of Internet Application
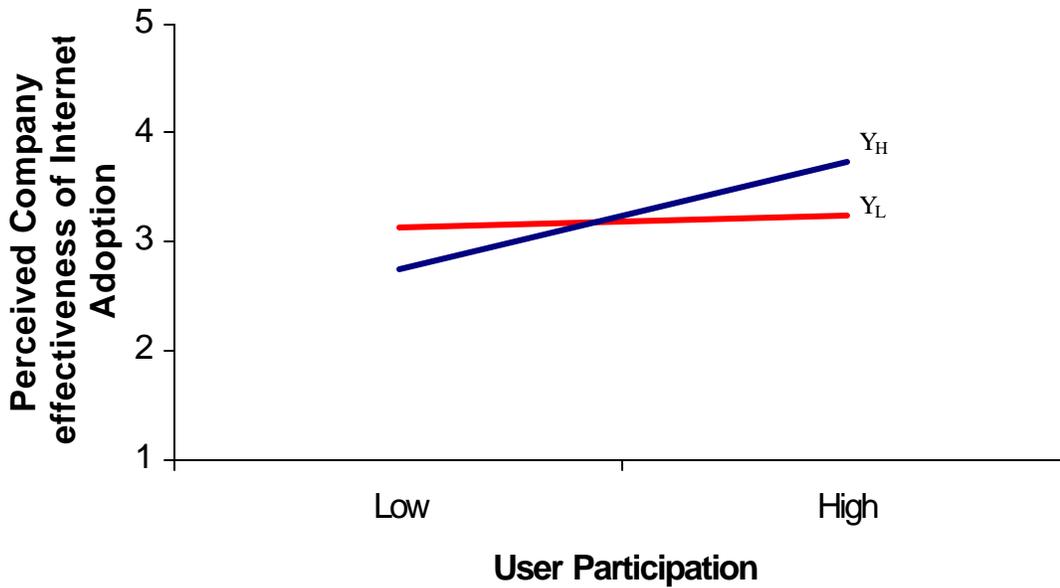

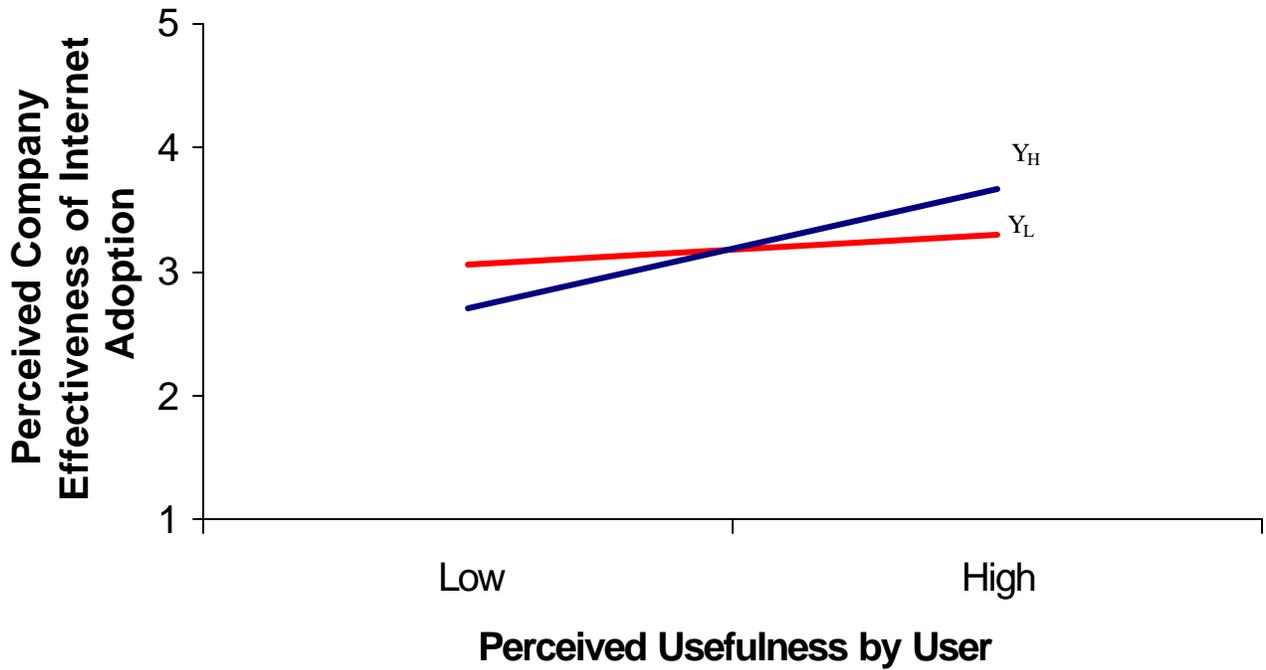**Figure 3. Interaction of Corporate Orientation and User Participation**

Figure 4. Interaction of Corporate Orientation and Perceived Ease of Use by User
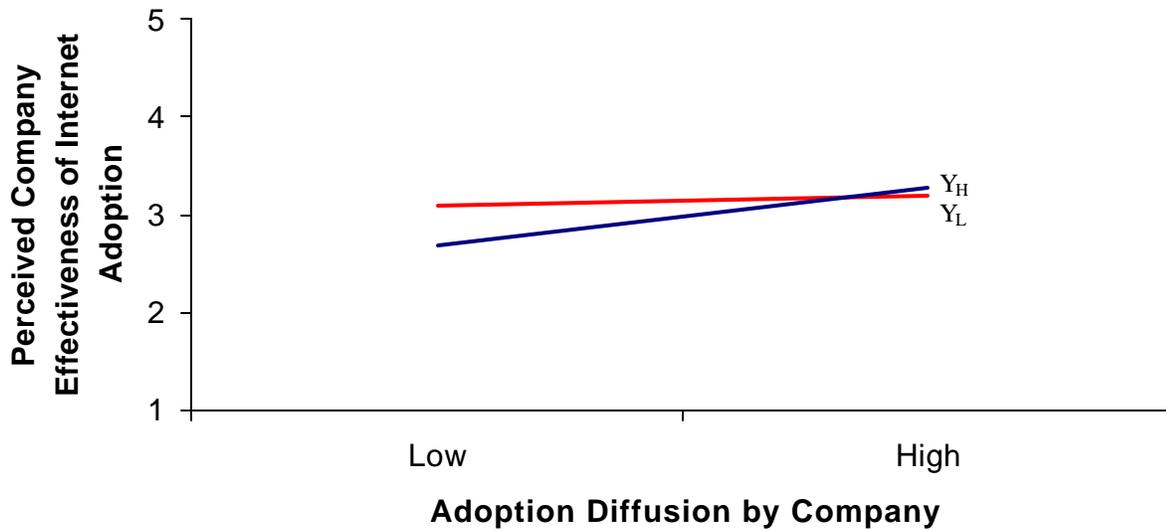

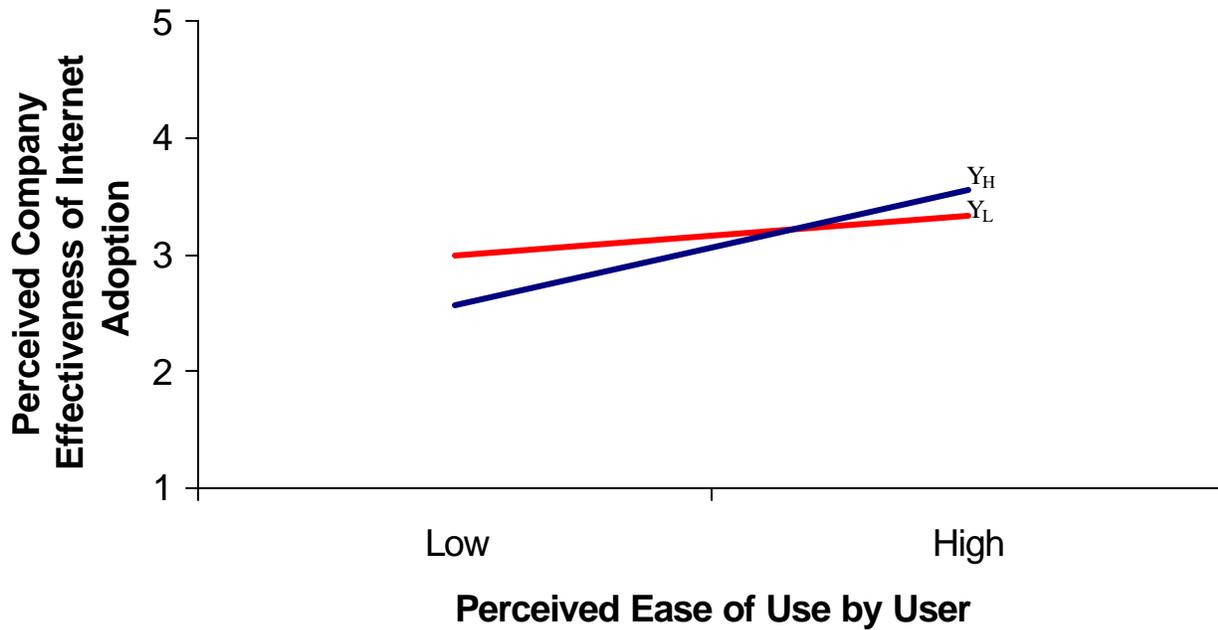**Figure 5. Interaction of Corporate Orientation and Perceived Usefulness by User**

Figure 6. Interaction of Corporate Orientation and Adoption Diffusion by Company

Discussion and conclusions

Patterns of directionally hypothesized and positively correlated relationships were observed with regard to high market orientation in moderating the relationships between all independent variables and the dependent variable "perceived company effectiveness of Internet adoption." Overall, this suggests that corporate orientation plays a moderating role in the adoption of Internet in organizations such that organizations with high marketing orientation more positively influence the relationship between Internet adoption factors and adoption effectiveness.

Research limitations

The contributions of the study should be considered in light of its limitations. These limitations, coupled with the findings of the study, provide opportunities for future research. First, the respondents of the study were top managers of organizations in the forest products industry who provided their perspective of the activities of users of Internet and other activities within their organizations. Future research should be directed to users (employees) within the organizations to capture their perception as well. Also only one industry sector was investigated. There is the opportunity to investigate IT adoption in other industrial sectors. Finally, this study did not compare the impact of marketing orientation vs. production orientation on Internet adoption per se but rather was confined to examining degrees of marketing orientation. An opportunity is opened for the study of how other orientation types could influence Internet adoption.

Managerial implications

Beyond the theoretical underpinnings, an understanding corporate culture has important practical implications. For example, corporate culture can be an important

predictor of organizational capabilities and outcomes (Desphandé et al. 1993, Moorman 1995). Understanding the process of information technology adoption and use is critical to maximizing organizational benefits. Specifically, understanding how employees form and maintain perceptions of an IT innovation would help management to maximize implementation success in both pre-adoption and post-adoption evaluation stages.

By examining corporate culture, specifically a marketing orientation, and IT adoption, study results may aid top organizational managers to understand some of the corporate culture/orientation factors that influence Internet adoption and to help them to more effectively implement these technologies. We agree with Griffith et al. (1999) who believe that technology implementation success can be improved with active top management support, clear implementation goals and user participation and training. Other success factors include a good understanding of the intended end-users, their tasks, and the interdependencies between the two, together with the understanding of how implementation fits into the overall business strategy (Martinsons and Chong 1999).

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